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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,182	10/02/2003	Jee-Soo Mok	LEPA121687	8329

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EXAMINER
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AHMED, SHAMIM

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 11/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/677,182

Applicant(s)

MOK ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 8/26/05 have been fully considered but they are not persuasive. Applicants argue that Kamayachi et al do not teach the step of laser beam irradiating onto the laminated thermosetting film to selectively remove the film, whereas Kamayachi et al teach exposing the thermosetting film to an actinic ray.

In response to the argument, examiner states that the argument is not persuasive because Kamayachi et al clearly teach **laser beam** is irradiated onto the thermosetting film in order to form pattern such as exposed and unexposed portion on the film, which pattern may be further treating with actinic ray for excellent adhesion capability of the solder resist pattern to be formed (col.16, lines 9-31).

Applicants also argue that Wolski et al teaches away from the claimed invention such as roughening the circuit board prior to lamination.

In response, examiner states that the argument is not persuasive because Wolski et al teaches it is conventional to roughen the circuit board prior to lamination using mechanical and chemical techniques, which are expensive and complicated (col.10, lines 20-20).

So, Wolski et al teaches a way to increase adhesion or bonding capability of the laminate not teaches away and further more, the claimed pre-treating is not limited not to perform chemical or mechanical abrasion to form roughen surface.

Examiner also states that Wolski et al teach that removing the stanproofing layer using a brief immersion with alkali produces microroughness on the matte surface of the

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circuit board leads to excellent adhesion capability without an additional roughening (col.10, lines 27-35), which also meet the claimed requirement of the pretreatment.

As to Paulus reference, applicant's argument is not commensurate with the claims because the claims are not limited to excluding or omitting other steps, argued by the applicants.

Therefore, the previous office action is repeated herein as follows:

***Specification***

2. The abstract of the disclosure is objected to because it is presented as more than one paragraph. Abstract should be in single paragraph and may not exceed 150 words in length. Correction is required. See MPEP § 608.01(b) [R-2].

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamayachi et al (4,943,516) in view of Wolski et al (5,447,619).

Kamayachi et al disclose a process of forming a solder resist pattern on a printed circuit board (col.1, lines 7-20), wherein the process including the steps of:

- laminating or depositing a thermosetting resin on a printed circuit board (PCB) having circuits formed thereon, wherein the resin can be in a wet or dry state (semi-cured);
- the coating is then directly exposed to a laser beam through a photomask having a prescribed pattern;
- post-curing the developed thermosetting resin pattern to form solder resist pattern (col.15, line 67-col.16, line 31).

Kamayachi et al remain silent about the pre-treating the printed circuit board before lamination step.

However, Wolski et al teach that it widely accepted practice in the manufacturing of printed circuit board (PCB) to pretreat or clean or microetch the circuit board using abrasion, scrubbing or chemical means for increasing bonding capability between the circuit patterns in the copper-clad laminate and polymeric resist material (col.4, lines 52-col.5, lines 14).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Wolski et al's teaching into Kamayachi et al's

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process for increasing bonding capability between the circuit patterns in the copper-clad laminate and polymeric resist material as taught by Wolski et al.

6. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paulus (5,626,774) in view of Wolski et al (5,447,619).

Paulus discloses a process of forming solder resist mask on the surface of a multilayered printed circuit board, wherein both side of a copper foil is laminated with a partially cured thermosetting resin, which is then irradiating or ablated with laser through an etch resist mask (col.1, lines 62-col.2, lines 14 and col.3, lines 5-11).

Paulus remains silent about the pre-treating the printed circuit board before lamination step.

However, Wolski et al teach that it widely accepted practice in the manufacturing of printed circuit board (PCB) to pretreat or clean or microetch the circuit board using abrasion, scrubbing or chemical means for increasing bonding capability between the circuit patterns in the copper-clad laminate and polymeric resist material (col.4, lines 52-col.5, lines 14).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Wolski et al's teaching into Kamayachi et al's process for increasing bonding capability between the circuit patterns in the copper-clad laminate and polymeric resist material as taught by Wolski et al.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed  
Primary Examiner  
Art Unit 1765

SA  
November 2, 2005